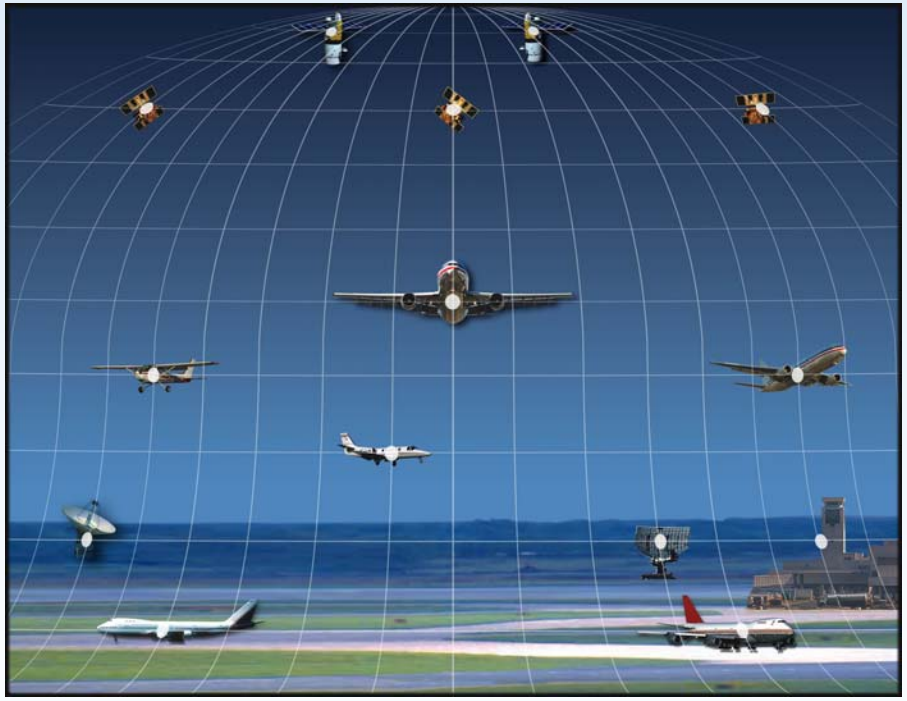
The Second ACAST Workshop

24-25 August 2004,

Cleveland, Ohio



ACAST Project Review

Bob Kerczewski

ACAST Project Manager

ACAST Project Review

OUTLINE

- Overview
- A year ago…
- FY 2004 Activities
- Approach to ACAST – Subproject Prioritization
- Milestones and Budget Overview
- Work Breakdown Structure
- Summary

ACAST Project Review

BACKGROUND

ACAST is a NASA research and development project focused on new communications, navigation and surveillance technologies to enable improved operations and increased capacity of the National Airspace System

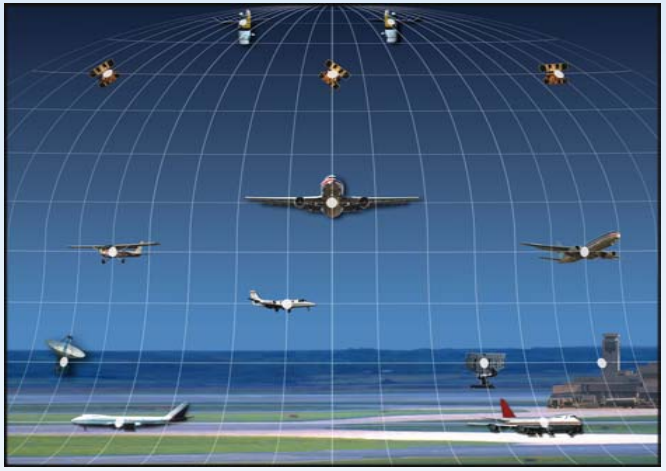
ACAST focuses on solutions to near and mid-term problems and needs, while keeping in mind long-term NAS goals for advanced, information network-centric CNS infrastructure

ACAST aims for an R&D mix focused more on near/mid-term technologies, or “higher TRL” projects intended to provide technologies ready for the implementation process. (NASA’s TNAS initiative will focus on long-term, or “lower TRL” technologies).

ACAST Project Review

Goal:

Initiate the transition of today's CNS systems into a high-performance network-centric digital infrastructure to support the future development of the National Airspace System



Objectives:

- Identify the transitional architecture to achieve the transformational high-performance integrated CNS (ICNS) system and define the global air/ground network architecture
- Develop efficient aviation spectrum utilization and support global spectrum allocations
- Enable efficient oceanic/remote operations through improved communications and surveillance
- Increase air-ground datalink performance and capacity for terminal and en-route operations
- Improve airport surface operations via an integrated wireless CNS network
- Develop high-payoff advanced CNS technologies

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ACAST Objectives at a Glance

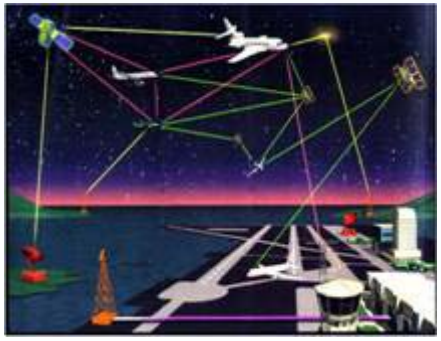
Transitional Architecture and Global Air/Ground Network

Spectrum Efficiency and Advocacy

Efficient Oceanic/Remote Communications & Surveillance

Improved Air/Ground Communications

Airport Surface Network



High-Payoff CNS Technologies

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ACAST Project Planning Summary:

- NASA GRC participation in CNS Research and Development under several NASA Aeronautics Programs and Projects from 1997 to present
- Major analyses of CNS requirements, architecture approaches and technology gaps
- Four NASA-GRC sponsored Integrated CNS Technology Conference and Workshops (2001, 2002, 2003, 2004)
- NExTNAS-CNS Workshop – August 2003
- Technical Interchange Meetings with industry, FAA, academic and international aviation organizations
- Proposed Subprojects appropriate for SBT identified and validated at August 2003 workshop
- Project formulation during FY 2004, investigated and analyzed these subprojects, developed project plans and cost estimates
- Subprojects prioritized and planned against expected SBT resources in June, 2004

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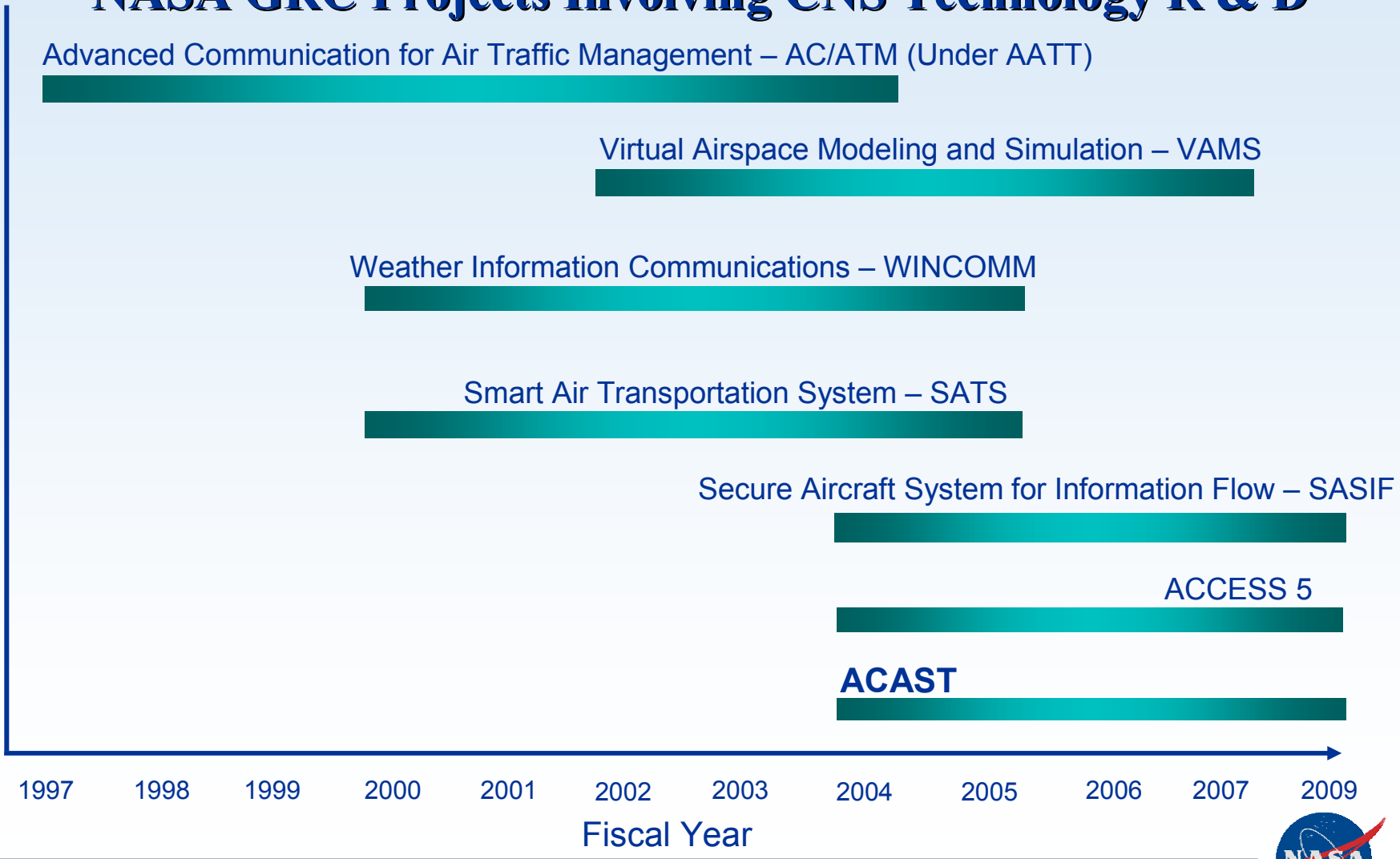
NASA GRC Projects Involving CNS Technology R & D



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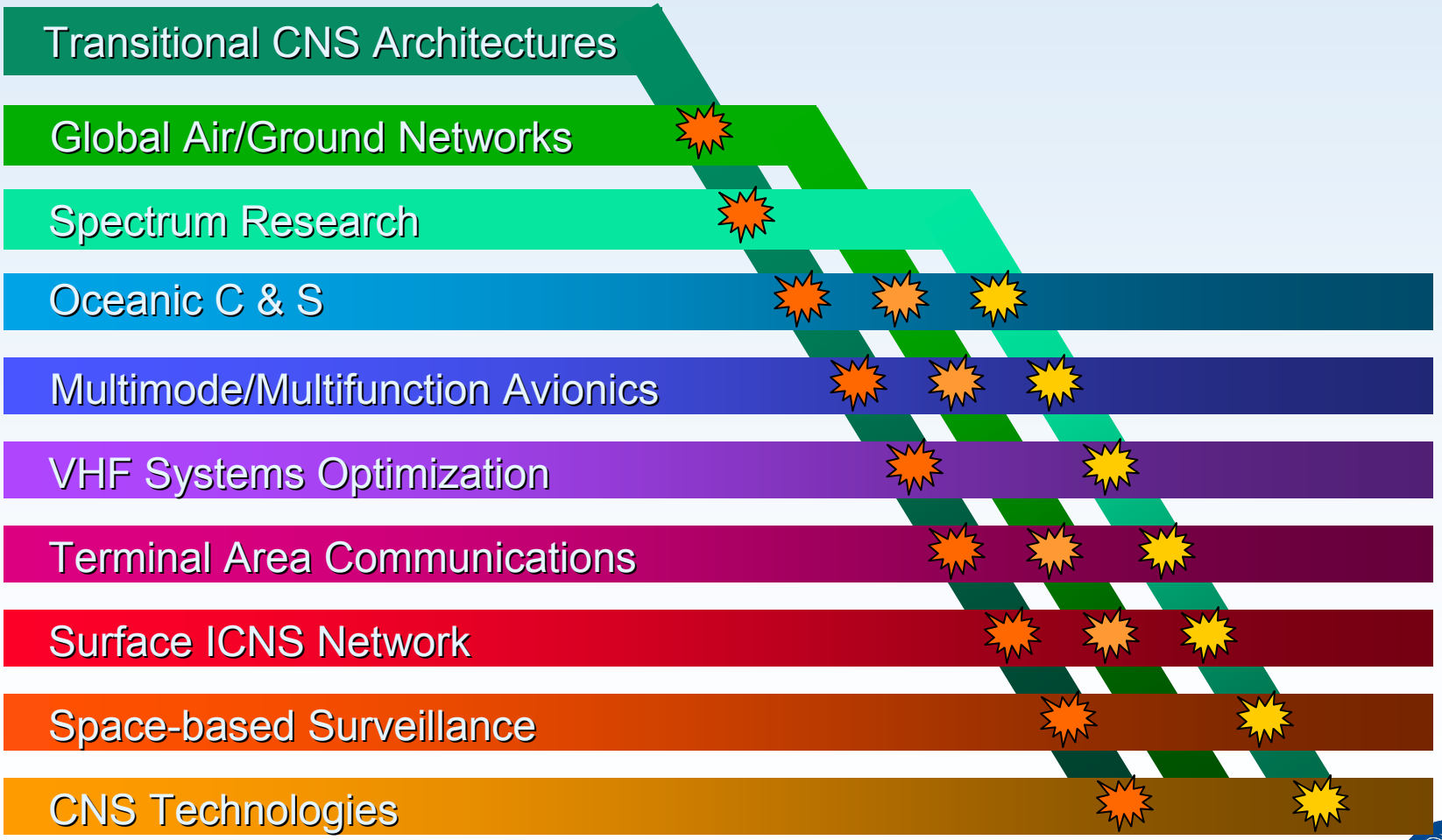
A year ago… These subproject areas were under consideration



ACAST Activities During Project Formulation (FY 2004)

- Identify initial subprojects for potential inclusion in SBT.
- Release external studies for MMDA, Surface ICNS Requirements, Global Network Requirements, and MLS Band Usage Feasibility.
- Future Communications Study – Technology Pre-screening contract started 24 May 2004.
- Additional external studies being prepared for spectrum, oceanic benefits analysis, and terminal area communications.
- Internal studies and analysis for all 10 proposed subprojects.
- Initial cost estimation exercises for all 10 subprojects.
- Subproject selection and resource allocation.
- Project Readiness Review successfully completed 9 July 2004
- Second ACAST Workshop – 24-25 August 2004

ACAST Project Review

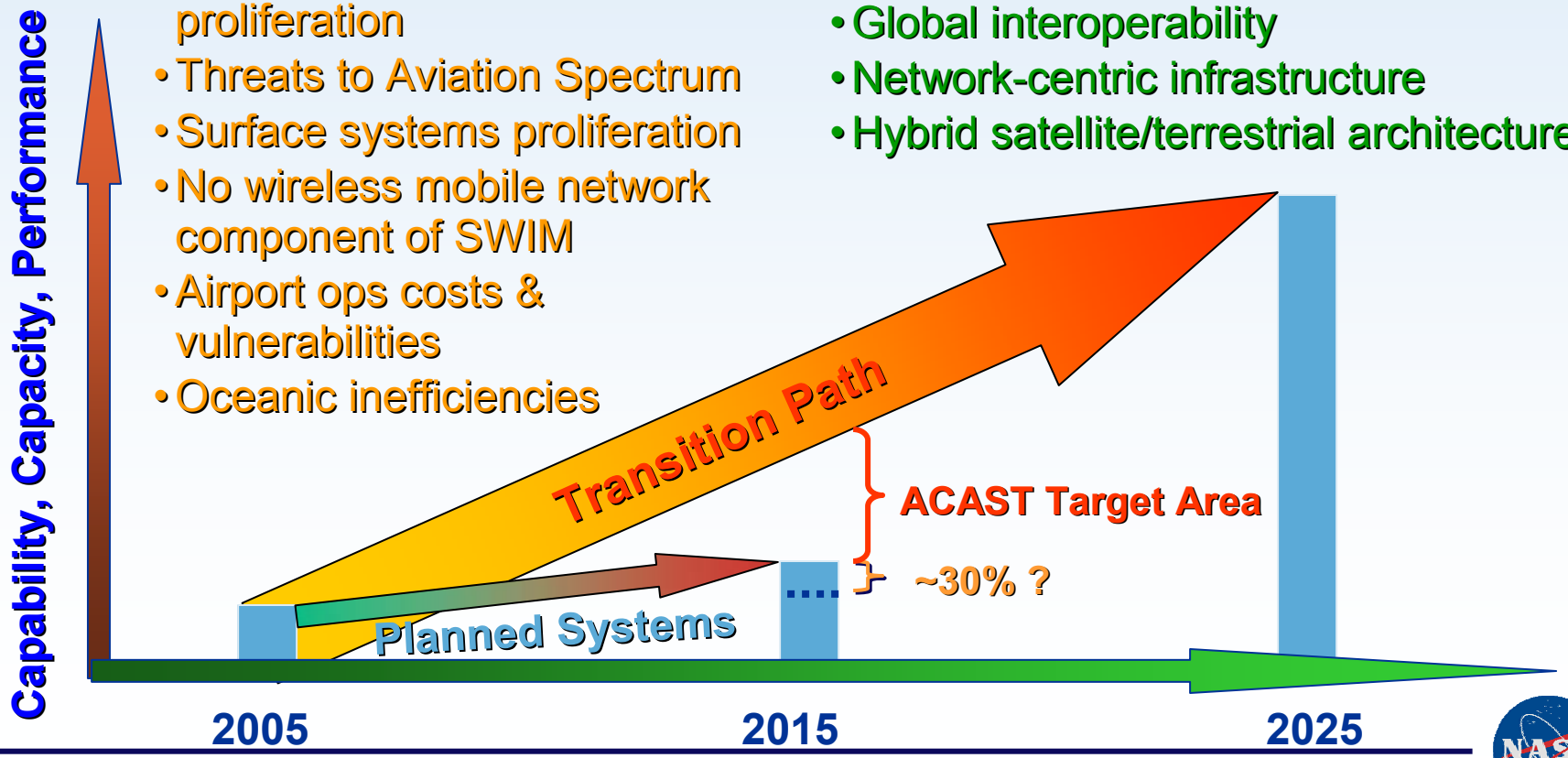
Focus on Near/Mid-Term Solutions that Enable Long-Term Goals

Key Near/Mid-term Issues

- Frequency congestion
- On-board avionics systems proliferation
- Threats to Aviation Spectrum
- Surface systems proliferation
- No wireless mobile network component of SWIM
- Airport ops costs & vulnerabilities
- Oceanic inefficiencies

Long-term Goals Enabled

- Transformational ConOps
- Increased integration of CNS systems
- Global interoperability
- Network-centric infrastructure
- Hybrid satellite/terrestrial architecture



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Focus on Near/Mid-Term Solutions that Enable Long-Term Goals

ACAST Research Area Prioritization

- The highest priority subprojects:
  - Multi-mode Multi-function Avionics
  - Surface ICNS Network
  - Oceanic/Remote Communications and Surveillance
  - CNS Architectures, Networks, and Spectrum
- With significant supporting work in:
  - Terminal Area and En- Route Communications
  - VHF Optimization
- And low-TRL, high payoff R & D:
  - CNS Technologies

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4 Key Subprojects address the most parameters

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MMDA

Surface ICNS

Oceanic C & S

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Architecture, Networks and Spectrum involve all aspects as well.

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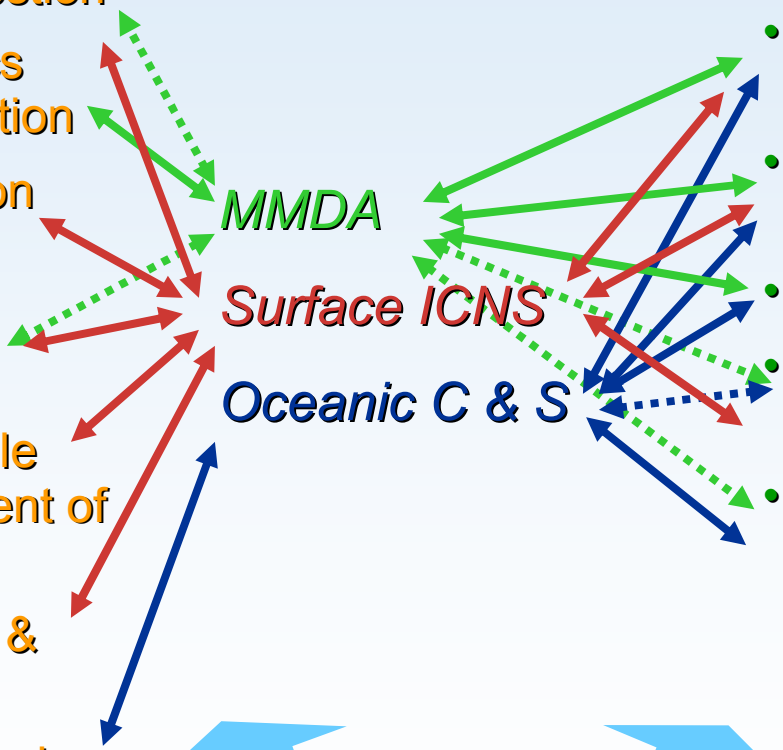

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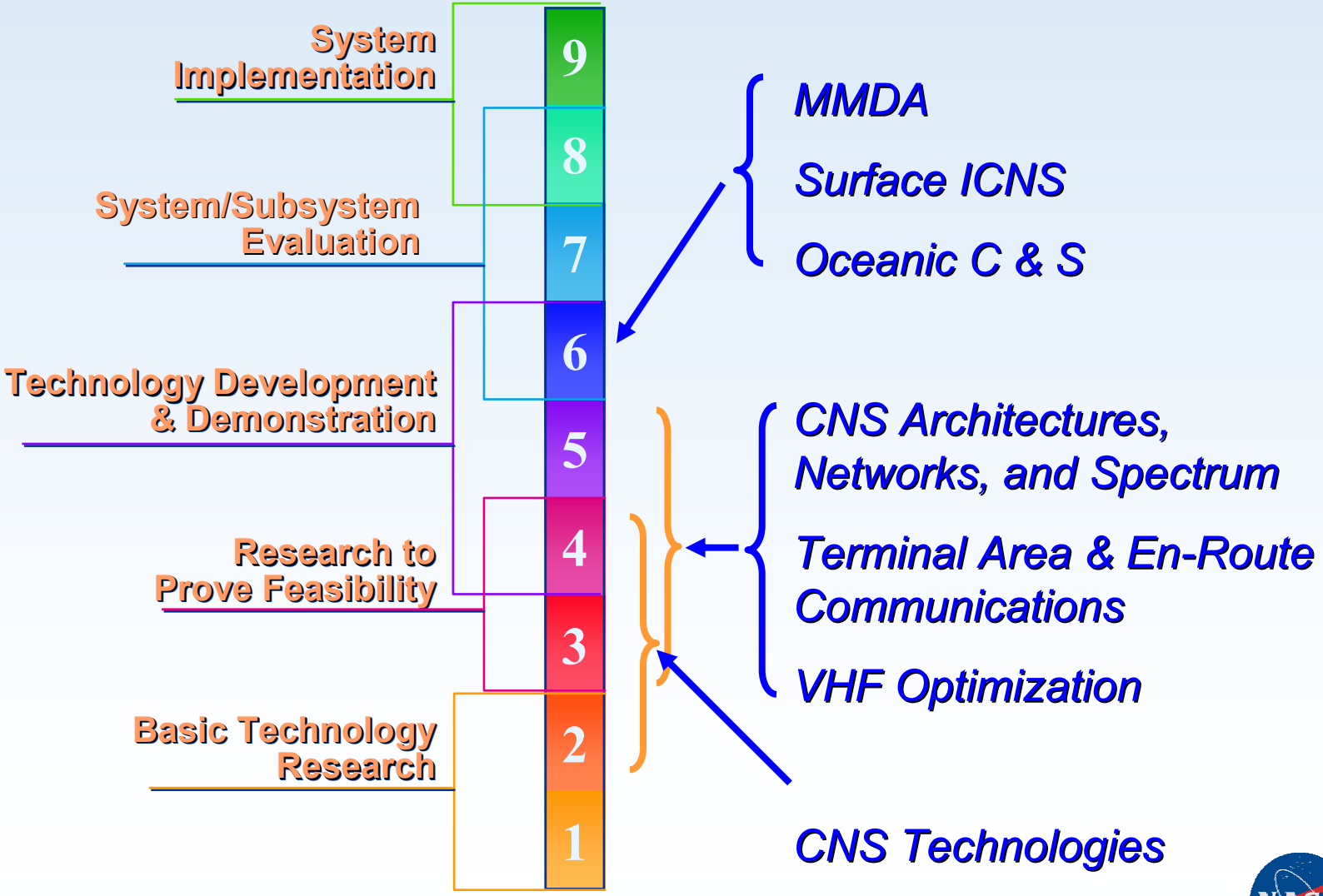
ACAST Subproject TRL Goals



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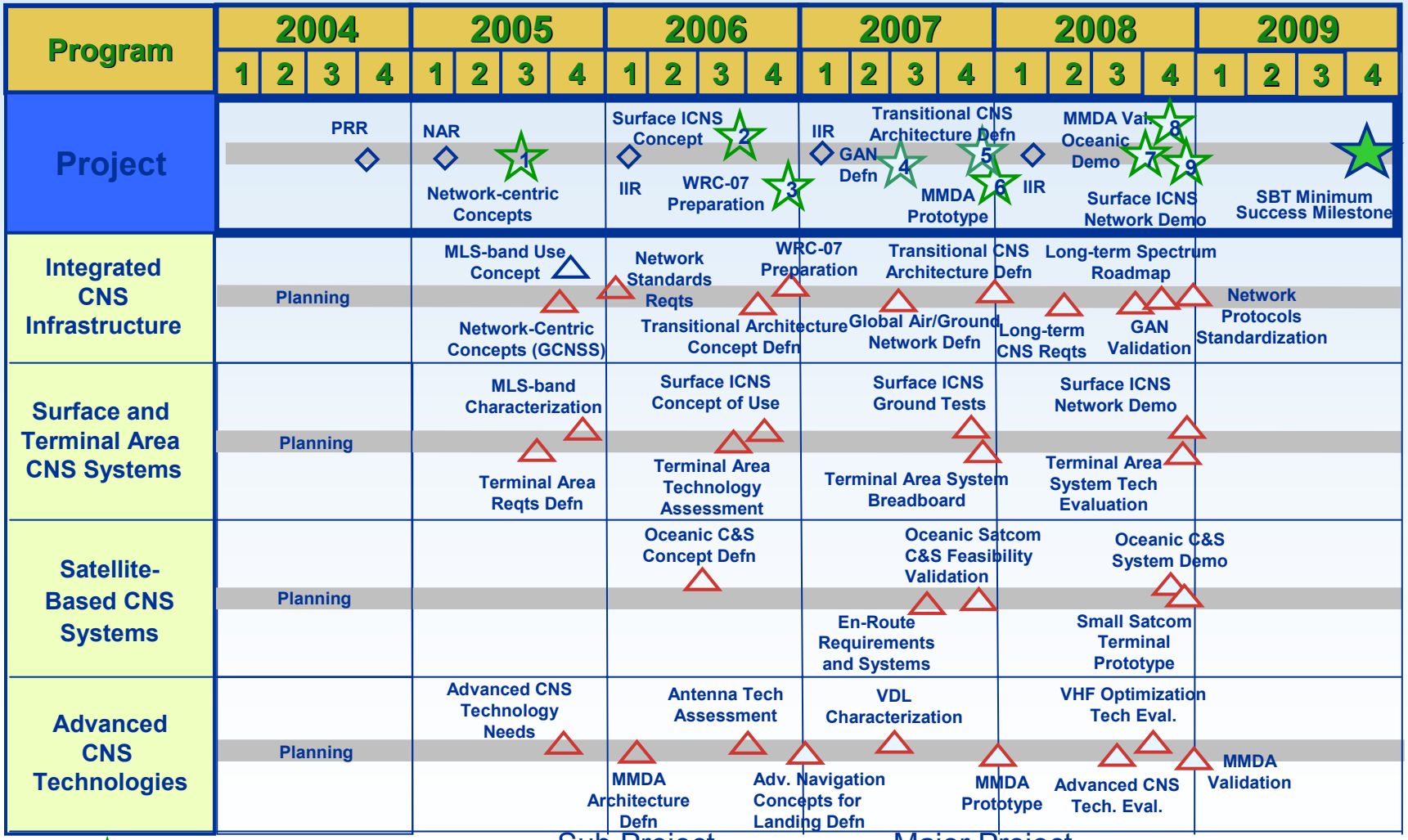
Milestones/Deliverables Schedule (approximate)



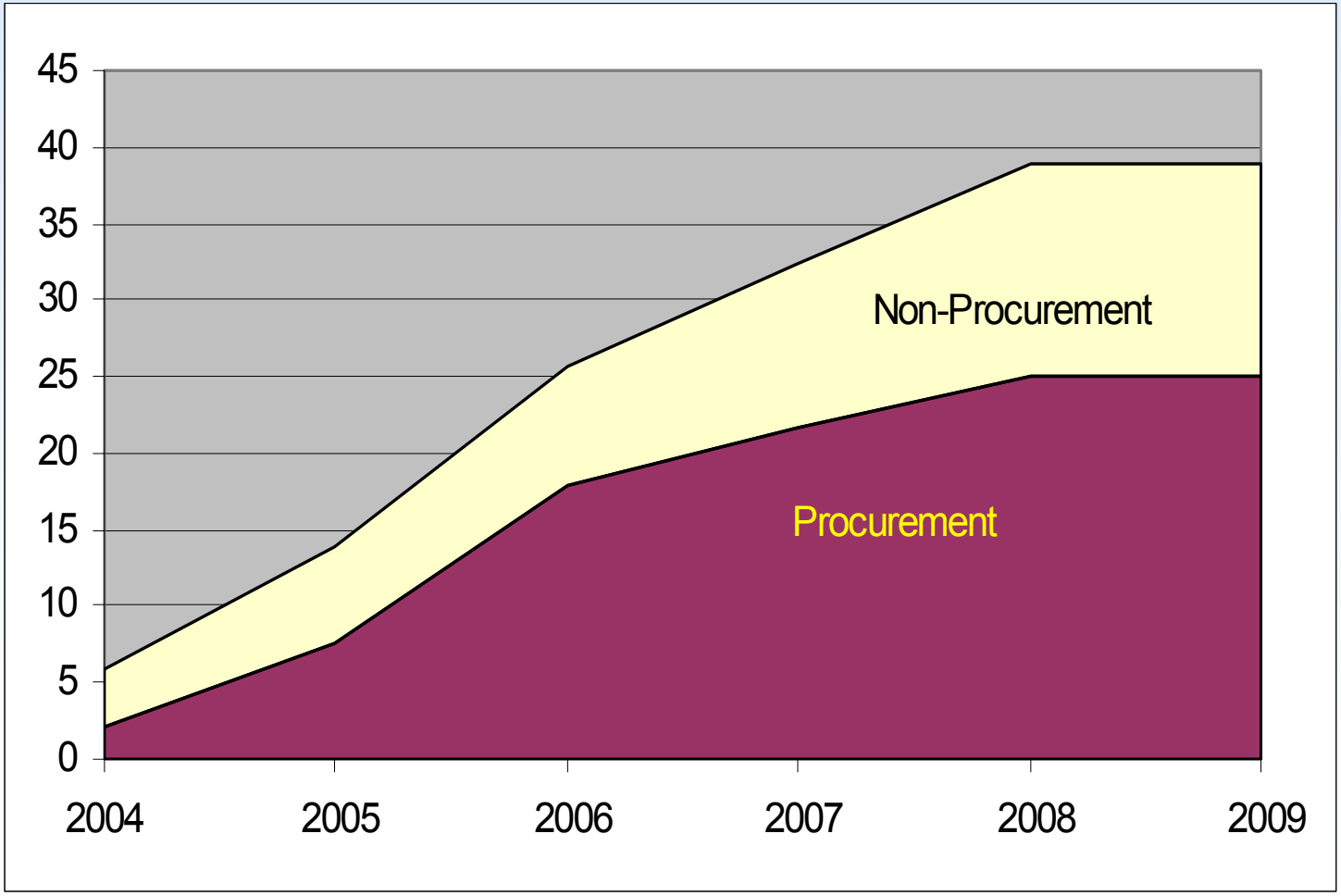
Deliverables - Project Milestones

Sub Project Milestones (Level 3)

Major Project Reviews

ACAST Project Review

ACAST Budget Overview



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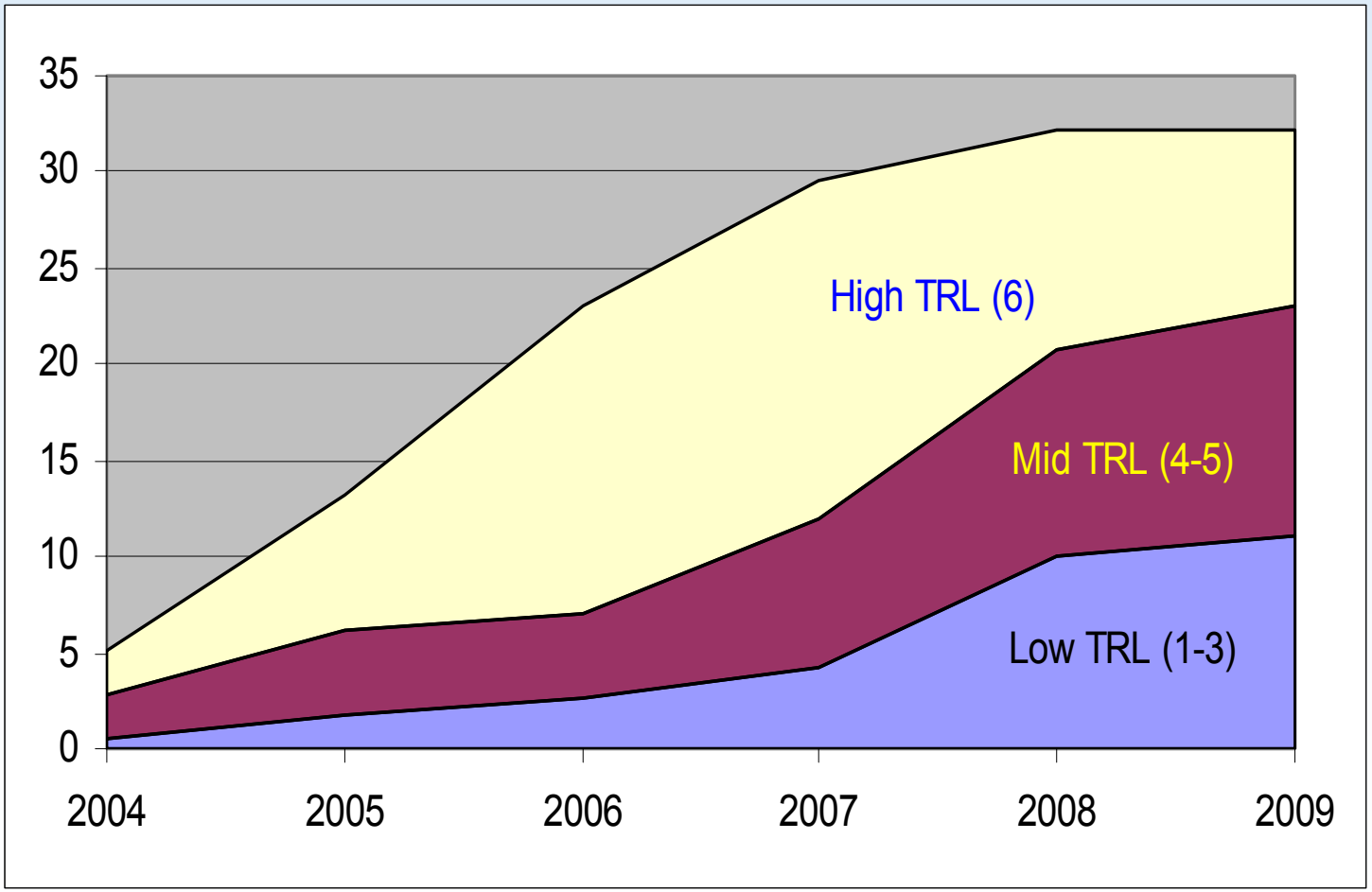
ACAST Budget vs. TRL (approximate)



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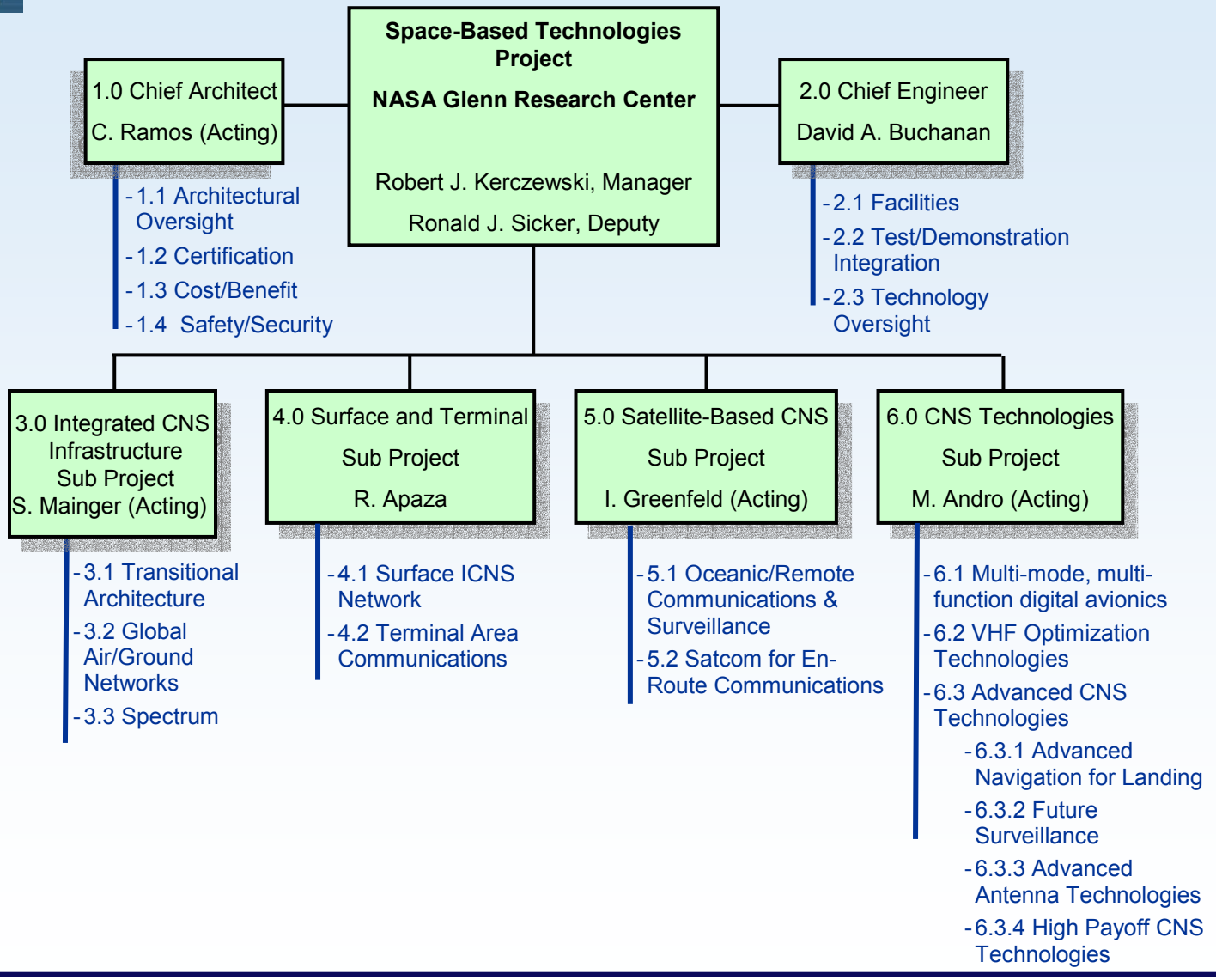
ACAST Work Breakdown Structure



ACAST Project Review

SUMMARY:

- FY 2004 consisted of project formulation and planning

  Planning, data gathering, study, investigation, education, cost estimation, discussions with aviation community, etc.

- High impact high-TRL technologies will receive emphasis in ACAST:

  MMDA, Airport Surface Network, Oceanic C&S

- Cross-cutting areas are also important:

  CNS Architectures, Network Technologies, Spectrum

- Mid-TRL and low-TRL technologies get later emphasis:

  VHF Optimization is most important of these

- The budget distribution reflects these priorities